We claim:-

1. A zeolite material of the pentasil type having an alkali metal and alkaline earth metal content of not more than 150 ppm and a molar ratio of Si to Al of from 250 to 1500, wherein at least 90% of the primary particles of the zeolite material are spherical and at least 95% by weight of the spherical primary particles have a diameter of less than or equal to 1 μm.

2. The zeolite material as claimed in claim 1, wherein the zeolite material at least partly has the structure type ZSM-5.

3. The zeolite material as claimed in claim 1 or 2, wherein the alkali metal and alkaline earth metal content of the zeolite material is not more than 100 ppm.

4. The zeolite material as claimed in any of claims 1 to 3, wherein the diameter of the spherical primary particles is in the range of from 50 to 250 nm.

5. The zeolite material as claimed in any of claims 1 to 4, wherein the molar ratio of Si to Al is in the range of from 250 to 750.

6. The zeolite material as claimed in any of claims 1 to 5, wherein the molar ratio of Si to Al is in the range of from 350 to 600.

7. A molding containing at least one zeolite material according to any of claims 1 to 6.

8. The molding as claimed in claim 7, additionally containing SiO_2 as binder material.

9. The molding as claimed in claim 7 or 8, containing binder material in a range of from 5 to 80% by weight, based on the total weight of the dried and optionally calcined molding.

10. The molding as claimed in any of claims 7 to 9, having a specific surface area of at least 350 m^2/g, containing pores having a pore volume of at least 0.6 ml/g.

11. The molding as claimed in any of claims 7 to 10, having a cutting hardness of from 2 to 15 N.

12. A process for the preparation of a zeolite material according to any of claims 1 to 6, comprising the steps
    (i) preparation of a mixture containing at least one SiO_2 source, at least one aluminum source and at least one template compound, wherein the mixture contains not more than 150 ppm of alkali metal and alkaline earth metal and wherein the at least one SiO_2 source and the at least one aluminum source are used in a ratio which permits the formation of a crystalline material having a molar ratio of Si to Al of from 250 to 1500;
    (ii) reaction of the compounds contained in the mixture to give a mother liquor containing crystalline material, said crystalline material containing at least a portion of at least one template compound;
    (iii) separation of the crystalline material from the mother liquor;
    (iv) removal of the at least one template compound from the crystalline material.

13. The process as claimed in claim 12, wherein a tetraalkoxysilane is employed as SiO_2 source and at least one tetraalkylammonium hydroxide is employed as template compound, and the mixture according to (i) additionally contains water.

14. The process as claimed in claim 13, wherein the alcohol which is formed in the mixture according to (i) is distilled off prior to the reaction according to (ii).

15. The process as claimed in any of claims 12 to 14, wherein the reaction according to (ii) is carried out at a temperature in the range of from 150 to 180°C in an autoclave with a reaction time of 1 to 48 hours.

16. The process as claimed in any of claims 12 to 15, wherein the crystalline material separated according to (iii) is at first dried according to (iv) at a temperature in the range of from 100 to 160°C and is subsequently calcined at a temperature in the of range from 450 to 700°C.

17. The process as claimed in any of claims 12 to 16, wherein, after step (iv), the zeolite material is exposed to water in an autoclave and is

subsequently dried at a temperature in the range of from 80 to 160°C and is subsequently calcined at a temperature in the range of from 400 to 750°C.

18. A zeolite material of the pentasil type having an alkali metal and alkaline earth metal content of not more than 150 ppm and a molar ratio of Si to Al in a range of from 250 to 1500, wherein at least 90% of the primary particles of the zeolite material are spherical and at least 95% by weight of the spherical primary particles have a diameter in the range of from less than or equal to 1 µm, obtainable by a process according to any of the claims 12 to 17.

19. A process for the production of a molding according to any of claims 7 to 11, comprising the steps
    (I) preparation of a mixture containing a zeolite material according to any of claims 1 to 6, or a zeolite material obtainable by a process according to any of claims 12 to 17, and at least one binder material;
    (II) kneading of the mixture;
    (III) molding of the kneaded mixture to give at least one molding;
    (IV) drying of the at least one molding;
    (V) calcining of the dried molding.

20. The process as claimed in claim 19, wherein the binder employed according to (I) is a SiO_2-containing binder material.

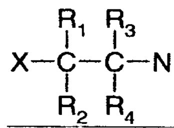
21. The process as claimed in claim 19 or 20, wherein the mixture according to (I) additionally contains at least one pore forming agent.

22. A molding, obtainable by a process according to any of claims 19 to 21.

23. Use of a zeolite material according to any of claims 1 to 6, or of a zeolite material obtainable by a process according to any of claims 12 to 17, or of a molding according to any of claims 7 to 11, or of a molding obtainable by a process according to any of claims 19 to 21, as catalyst.

24. The use as claimed in claim 23, wherein the catalyst is employed for the synthesis of triethylenediamine.

25. A process for the preparation of triethylenediamine or of an alkyl-substituted derivative thereof by reacting at least one starting material which has a structural unit according to formula (I)



(I)

where R_1, R_2, R_3 and R_4, independently of one another, are hydrogen or an alkyl-group having 1 to 4 carbon atoms and X is an oxygen or nitrogen atom, wherein the reaction is carried out over a zeolite catalyst which contains a zeolite material according to any of claims 1 to 6 or a zeolite material obtainable by a process according to any of claims 12 to 17.

26. The process as claimed in claim 25, which comprises reacting a starting material consisting of

(A) x% by weight of piperazine (PIP) and

(B) y% by weight of ethylenediamine (EDA),

where $x + y = 100$ and $0 \leq x \leq 100$ and $0 \leq y \leq 100$.

27. The process as claimed in claim 26, wherein the starting material is reacted in at least one solvent or diluent.

28. The process as claimed in any of claims 25 to 27, wherein at least a portion of the zeolite material of the catalyst is used in the H form.

29. The process as claimed in any of claims 26 to 28, wherein x is 0 and the reaction is carried out at a temperature in the range of from 300 to 400°C and a pressure in the range of from 0.01 to 50 bar.

30. The process as claimed in any of claims 26 to 28, wherein y is 0 and the reaction is carried out at a temperature in the range of from 300 to 450°C and a pressure in the range of from 0.01 to 50 bar.

31. The process as claimed in any of claims 26 to 28, wherein x and y are unequal to 0, and water, EDA and PIP are present in an amount of from 10 to 50% by weight based on water and in an amount of from 90 to 50% by weight based on the sum of the weights of EDA and PIP.

32. The process as claimed in claim 31, wherein the reaction is carried out at a temperature in the range of from 290 to 400°C and a pressure in the range of from 0.01 to 10 bar.

33. The process as claimed in claim 31 or 32, wherein EDA and PIP are present in a weight ratio in the range of from 1:1 to 10:1, calculated as the ratio of the weight of EDA to the weight of PIP.